1. With serum of epileptics during the various phases of the regular course of the disease; *i. e.*, before, after and during the attack, and during the interval. Serum from a patient having attacks every 20-25 days was mixed with antiserum (0.5 ccm. in 10 ccm. of the former) and injected into another epileptic. The effect was the same in every case, namely, that the ccm. of serum neutralized the toxic effect of the 0.5 ccm. of the antiserum, in greater part or entirely.

2. With serum of severe cases (status epilepticus). This serum was *hypotoxic;* injected alone, it never produced signs of acute poisoning; on the contrary, almost without toxic effect. When 10 ccm. of the serum from this patient, with ½ ccm., also ¼ ccm. antiserum, injected into another epileptic, produced at once the symptoms of an acute specific poisoning.

3. Experiments with the serum of epileptics, which following the injection of specific antiserum, also following the injection of hypertoxic serum of other epileptics, showed an aggravation of the disease, and at the same time a diminution of the antitoxic power of the blood-serum of these patients against the specific antiserum.

A. C. Buckley (Philadelphia).

Miscellany

The Non-Toxic Amblyopias. T. W. Moore, Huntington, W. Va. (Journal A. M. A., Aug. 26).

The author classes the non-toxic amblyopias under three heads: 1. Those cases of amblyopia exanopsia held to be due to inability to use corresponding areas of the retina at the same time. This may be due to high refractive errors, to improper muscle balance or to non-development of the cerebral fusion center. 2. The hysterical amblyopias. 3. The somewhat similar but different group characterized by impaired vision, contracted fields for white and normal color fields, the color vision being proportionate to the general visual acuity; these cases are usually designated as anesthesia of the retina. Lastly, there is a sub-group of these latter due to traumatism, often with pathologic changes of the fundus from old hemorrhage or choroidal rupture that has left the parts uninvolved in a healthy condition, though vision has not returned. These cases are closely allied to the preceding group, differing only in etiology and in the limited results of treatment. Amblyopia exanopsia is usually easy of diagnosis, the defective vision, apparently normal fundus, frequent squint of one eye and the high refractive error making it clear from the first. Moore finds the convex-glass cure of Fronmuller the most satisfactory treatment, and reproduces the directions in full. In some of his cases he has had surprisingly good results, and some improvement in all in which he could command the coöperation of the patient. With the hysterical amblyopias the diagnosis is also, as a rule, not difficult. The concentric and constant narrowing of the visual field with reversal for colors is characteristic. Other conditions may show the contraction, but not with the color reversal. In addition, there are the other signs of hysteria, both ocular and otherwise, to aid in the diagnosis. The treatment consists in general measures to build up the patient's health, correction of the hysterical tendency and of any errors of refraction, etc. As regards the cases grouped by him in his third class, and which fall etiologically under two heads, those due to traumatism and those of unknown causation, Moore disagrees with Charcot and Leber as to these being hysterical, and holds that the trouble is really in the retina instead of in the brain. An illustrative case is reported. His treatment in these cases is electricity, and he finds the faradic and high-frequency currents equally as efficient as the galvanic, and the high-frequency current perhaps the most useful. He applies the electrode over the closed lids, usually using the unipolar, though the bipolar is equally useful; in applying the latter his method is to let the patient hold the other electrode in his hand. With the reflex amblyopias from irritation of the fifth nerve he has had no experience.

OCULAR SYMPTOMS OF ACCESSORY SINUS AFFECTIONS (W. C. Posey, Philadelphia, Journal A. M. A., Sept. 9).

While the average member of the profession, the author remarks, is conversant with the general symptomatology of sinus disease, there are yet many of the less striking symptoms with which they are less familiar. Many of these are among the earliest ones, and are attributed to eyestrain and refraction advised. In some cases the use of atropin employed to put the ciliary muscle at rest dries up the secretion and actually effects a cure. This, however, does not always happen, and much damage and loss of time may follow the error. Among the less frequent symptoms he includes implication of the optic nerve and disturbances of vision. The condition, he states, is to be studied by the usual methods with the ophthalmoscope, test cards, perimeter, etc. Orbital disease is usually secondary to sinus disease, and one of the earliest signs is a change in the contour of the orbital ring. The particular sinus involved cannot always be made out, but the character of the orbital displacement is often significant. Optic nerve involvement, circulatory disorders of the orbit and conjunctiva, etc., may also be of diagnostic value, but the symptoms may be obscured by the anatomic variations of the sinuses, which are not infrequent. Sinusitis is only rarely a direct cause of lachrymal disease, though it may more frequently produce it indirectly by way of the nasal mucosa. Edema of the lids is one of the most significant signs of accessory sinus disease, and may often first call attention to its existence. It is non-inflammatory, is usually most marked on the upper lid, and in the morning, disappearing during the day. A persistent blepharitis may accompany the chronic conjunctivitis of sinus disease, and may disappear only with the removal of its cause. The close anatomic association of eye muscles and nerves accounts for the occurrence of ocular paresis or paralysis from sinus disease. Paresis, indeed, may occur in very mild cases, and Posey is of the opinion that if many of the cases of palsy of extraocular muscles attributed to rheumatism were analyzed an affection of a sinus would be found to be the underlying cause in many instances. Conjunctivitis may be the result of the general mucous congestion, and occasionally there may be an implication of the cornea, either indirectly from the exposure incident to the exophthalmus, etc., or by implication of the fifth nerve. Pupillary changes may accompany the optic neuritis when it exists. Posey considers that intraocular affections, uveitis, etc., must be very rare, though some authorities hold that they are frequent. Refraction disorders and asthenopia occur from the pressure on the orbit and inflammatory interference with the musculature, etc. Headache and neuralgia are pretty constant attendants of sinusitis, and while not always characteristic, are often decidedly so. The special features are given in detail. Other symptoms of a general character, fever, evidences of cerebral congestion and irritation, neurasthenia, gastric disturbances, and even marked mental symptoms may also be induced. Cerebral symptoms indicating involvement of the meninges, or sometimes even brain abscesses, may occur.

THE PATHOLOGIC EFFECTS OF ALCOHOL ON RABBITS (J. Friedenwald, Baltimore, Journal A. M. A., Sept. 9).

The author publishes the results of a study of the effects of alcohol on rabbits. The general summary of these results has been already given by Professor Welch in the two-volume work of the "Committee of Fifty" on "The Physiologic Aspects of the Liquor Problem," noticed in *The Journal A. M. A.*, Nov. 16, 1903, p. 1361, but is quoted here in detail.

One hundred and twenty rabbits were utilized, and the observations extended over a period of several years. The smallest weekly dose was 20 c.c., the largest 50 c.c. The animal that lived longest consumed over 10 liters of absolute alcohol; another consumed over 18 liters of whiskey. There was a marked difference in the susceptibility of different animals, some dying after a few doses, others surviving for years. Young and small rabbits and pregnant females seemed most susceptible The animals usually gained somewhat in weight at first; this was followed by a stationary period, and then a rapid fall preceding death. During intoxication the temperature fell 1 to 1.5 degrees. The blood examinations showed a fall to half the normal in the percentage of hemoglobin, but no marked change in blood cells till just before death. The gastric free hydrochloric acid decreased under the influence of the alcohol, and in some cases albumin and casts were found in the urine; in some cases in which these were not found the autopsy revealed kidney lesions. Alcohol evidently has a marked tendency to produce abortion in rabbits. Out of a series of 38 pregnant rabbits 20 died of septicemia following abortion, and the organism of rabbit septicemia was found in all, though they had been thoroughly isolated from one another. Of the rest, nine had constant abortions, none coming to full term. Three had normal deliveries, but the young all died a few days after birth. Complete autopsies were made in all cases. The lesions found were fatty degeneration of the heart muscle, which was lacking in animals killed after cessation of the use of alcohol, showing that it was not a permanent condition; fatty lesions of the liver and kidneys were also observed in some cases, and occasionally liver cell necrosis, singly or in groups. The experiments failed to produce satisfactorily genuine hepatic cirrhosis, though the liver was found more or less cirrhotic in a few instances. Fatty degeneration of the kidney tubules, thickening of the vessels and atrophy of the glomeruli were noted in a number of cases; in others no changes were observed. Evidences of gastric ulcerative processes were seen in a few instances; congestion was more common. The intestines were usually normal. The testicles frequently showed a diffuse fine deposition of fatty granules in the epithelium of the tubes and interstitial cells. The most notable changes in the brain, as reported by Dr. Berkley, were atrophy of the cortical cells, which was apparently quite marked.

STUDIES OF FEEBLE-MINDEDNESS. Shepherd Ivory Franz (Journal of Philosophy, Psychology and Scientific Methods).

Under this title there have been included the following articles on idiots, imbeciles, *enfants arrièrés, enfants faibles d'esprit* and on *enfants anormaux* and abnormal children when it was evident that the term "abnormal" was used synonymously, or nearly so, with "feeble-minded":

1. "Les enfants anormaux à Bruxelles. Demoor et Daniel. *Année psychologique,* 1900, VII., 296-313.

2. "Expériences de copie: essai d'application â l'examen des enfants arrièrés." Simon. *Ibid.,* pp. 490-518.

3. "Interprétation des sensations tactiles chez les enfants arrièrés." Simon. *Ibid.,* pp. 537-558.

4. "Eine experimentalle Studie über die Association in einem Falle von Idiotie." A. Wreschner. *Allg. Zeitsch. f. Psychiatrie,* 1900, LVII., 241-339. (Complete account of association experiments. Prolix, but good in giving material for comparison.)

5. "Taste and Reaction Time of the Feeble-Minded." A. R. T. Wylie. *Journal of Psycho-Asthenics,* 1900, IV., 109-112.

6. "Study of the Senses of the Feeble-Minded." A. R. T. Wylie. ***Ibid.,* pp. 137-150.**

7 "Memory of the Feeble-Minded." A. R. T. Wylie. *Ibid.,* 1900, V., 16-24.

8. "Motor Ability and Control of the Feeble-Minded." A. R. T. Wylie. *Ibid.*, pp. 52-58.

9. "L'illusion de poids chez les anormaux et le 'Signe de Demoor.'" E. Claparède. *Arch. de Psychol.*, 1903, II., 22-32.

10. "La mesure de l'attention chez les enfants faibles d'esprit (phrenastheniques)." F. Consoni. *Ibid.*, pp. 209-252. (Good material, but not sufficient work on normal children for comparison. Esthesiometric results not checked by other methods.)

11. "Notes sur la psychologie des enfants arrièrés." T. Jonckheere. *Ibid.*, pp. 253-268.

12. "Psychophysical Tests of Normal and Abnormal Children." R. L. Kelly. *Psychol. Review*, 1903, X., 345-372. (Incomplete and evidently hasty work. Not sufficient account of methods for purposes of confirmation. Subjects not described.)

13. "Experimental Studies in Mental Deficiency: Three Cases of Imbecility (Mongolian) and Six Cases of Feeble-mindedness." F. Kuhlmann. *Aher. Jour. of Psychol.*, 1904, XV., 391-446. (Excellent article. Material well digested. Good bibliography.)

14, 15. "Ueber die Assoziationen von Imbezillen und Idioten." K. Wherlin. *Jour. f. Psychol. u. Neurol.*, 1904, IV., 120-123, 129-143. (Confirmation and extension of Wreschner's work. Many cases.)

The study of the mentally defective classes is of interest and importance to both physicians and psychologists. Unfortunately, however, psychologists have concerned themselves almost wholly with the investigation of the mental processes of normal people, and have not considered the subject of abnormal psychology. Physicians, on the other hand, are interested in abnormal psychology, but largely and almost exclusively in those mental processes which are of importance for diagnosis, and those which help in making prognoses. What information we have, therefore, is meager in amount and, perhaps, as is sometimes said, superficial. Many interesting mental phenomena are noted and explained in an offhand way, and many have not been noted, because they are thought to be of little diagnostic or prognostic importance. The conditions which have been studied only superficially and those which have not been studied are likely to throw light upon similar, but elusive, processes in normal people. Much valuable information could be obtained from a study not only of the defects, but also of the exaggerations and the inconsistencies in the insane and feeble-minded.

The possible difficulties of experimentation upon the insane and the mentally deficient may have kept some psychologists from attempting investigations. It may be said, however, that the difficulties have been greatly exaggerated, and such difficulties as there are may be readily surmounted. Opportunity for the careful and systematic study of patients may be obtained readily at many hospitals. Whatever former disinclination to the study of patients by "outsiders" medical men may have had has given place to a willingness to have careful experiments made to obtain a better knowledge of the psychical conditions in the mentally abnormal. The studies which are reported in this review indicate clearly that it is considered necessary to have general observations, such as are given by Solier,[1] analyzed, supplemented and verified by a careful study of cases by experimental methods.

The feeble-minded have been classified according to many different criteria—speech, moral and intellectual capacity and dulness, extent of mental faculties and attention—and the names designating the conditions have widely differed. Dagonet makes four classes: (1) Simple-minded, (2) imbecility, (3) idiocy, (4) automatism. Voisin has used the term "mental debility" in about the same sense as Dagonet's "simple-minded."

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[1] Psychologie de l'idiot et de l'imbecile. 2d Edit. Paris, 1901.

[1] Op. cit., p. 17.

Sollier, who bases his classification upon the process of attention, divides the feeble-minded into three classes only: "(1) Absolute idiocy, a complete absence and impossibility of attention; (2) simple idiocy, a feebleness and difficulty of attention; (3) imbecility, instability of attention." In all cases Sollier says there is not only a diminution in quantity, but also a modification in quality of the mental faculties. Moreover, it may be added, all idiots present cerebral lesions and are thus further differentiated from normal people and imbeciles.

1. *Sensation.*—Several authors have cited the disturbances and aberrations of sensation as the cause of the lack of mental ability in some of the feeble-minded. It is undoubtedly true, as has been pointed out, that the absence or alteration of sense organs prevents the associational processes ordinarily concerned with these spheres, and to that extent there is a defect of the mental life. Blindness or deafness or the lack of other senses, or a combination of two or more defects in one person, does not necessarily produce an incapacity for the associations in other sensory motor paths. Sensory defects may contribute to, but they are probably not the greatest and certainly not the only factors in, the production of mental weakness.

Most idiots, Schleich found, are hypermetropic, while in normal children there is a tendency to myopia. Wylie (6) found in the children examined by him a visual dulness six to eight times the normal, and Kelly (12) in the pupils of the Physiological School (who are not described, but who are probably imbeciles), found poor vision. One-half were below the standard of keenness, and there was astigmatism in all but one or two. On the other hand, Sollier makes the general statement that "in imbeciles hearing as well as sight presents nothing abnormal." Schleich has defined the abnormality in the feeble-minded, but from the articles by Wylie and by Kelly it is impossible to tell what the differences are.

Owing to the incomplete color vocabulary of many idiots and imbeciles it is difficult to make determinations of the color sense. Jonckheere (11) and Kelly (12) agree that often color vision is defective. Kelly reports six out of twelve children with some kind of color blindness and one with total color blindness. Only two of Kelly's cases had an accurate color vocabulary, and the same deficiency has been noted by Jonckheere. Furthermore, Jonckheere states that in these cases it is very difficult to develop the sense (terminology).

Only two cases in the Physiological School were found to have normal hearing (12), but in other places nothing abnormal has been found (6 and Sollier, see above).

Taste and smell are very often dulled or perverted in the feeble-minded. The general statement is made that simple idiots are voracious and gluttonous, and that imbeciles are nearly all gourmands. Idiots will carry to their mouths anything which comes to hand just as very many normal children do—but, in addition, some will eat salt as if it were sugar. Stones, earth, sticks, bugs, and even excrement, are swallowed by those in whom taste is lacking or perverted. Of 66 children examined by the solutions of quinine, acid and salt 23 could not tell any difference, 16 responded to the bitter, 40 to acid and 22 to salt. Twenty of the brightest children averaged for threshold—sugar, 1.3 per cent. solution; salt, 0.48 per cent.; acid, 0.41 per cent.; quinine, 0.0177 per cent. (5).

The pain threshold is higher than in normal children (6 and 12), temperature threshold higher (12), touch dulled (6), and the double point threshold of touch increased 3 and 13), while the muscle sense is unusually bad (6 and 11). Wylie (6) found a dulness of the muscle sense, varying according to the general mental ability, and because of its importance in the education of the feeble-minded efforts are now being made toward a thorough training in this field.

Demoor (1) has found, and Claparède (9) has confirmed, a reversal of an ordinary weight illusion in cases of idiotism. When two masses of unequal size but of equal weights are lifted the smaller is judged the heavier. This illusion is found in children from the age of 6 or 7, and is constant throughout life in normal people, but in lower grades of idiotism a reverse judgment is given constantly in some cases, and in others the illusion is absent. The reverse illusion—called the "sign of Demoor"—is found in those cases which are incapable of education, and it has been suggested as a means of diagnosis of idiotism in its worst form. Claparède concludes from his study that "the presence of the weight illusion does not mean that the feeble-minded are of a teachable type, but the "sign of Demoor," when present, speaks strongly in favor of idiotism."

2. *Motor Ability and Fatigue.*—Motor training is the kind of education to which most of the feeble-minded readily respond and upon which depends much of their other teaching If the movements are rapid and accurate and under fair degree of control, much may be hoped for in any attempt to improve their condition. Considerable attention has been devoted, therefore, to the study of motor ability, particularly in relation to school work in the hospitals.

Strength and steadiness (8), accuracy and rapidity of movement (12 and 13) are all less than in normal children, and the threshold of movement is larger (12). Experiments similar to those made by Fullerton and Cattell on the accuracy of perception of the extent of movement in 34 children of the Minnesota School showed no appreciable deviation from the normal (although the author concludes that there is an error of 2 to 10 times the normal) (7). All the experimenters found a very slow rate of tapping and arm movement (8, 12 and 13). Kuhlmann (13) obtained results of practice in accuracy—throwing at a target—but the curve is not regular and showed a decrease in ability so that occasionally it dropped to a point below which it had started. This is undoubtedly due, as the author points out, to decreasing interest; but when the interest is again aroused, as was done, the curve rises again.

The experiments on tapping—most rapid and continued movements—were examined for evidence of fatigue. Many of the subjects tapped at a very slow, but continued speed throughout the experiments, and it was difficult, sometimes impossible, to make them tap at a faster rate. The average maximum rate is very slightly above the normal rate. Some tapped faster at first and gradually decreased in rapidity, but neither Wylie (7) nor Kuhlmann (13) believes the decrease to be due to fatigue. Kelly attributes the result to a rapid fatigue, but disregards certain results. Of the children examined by him three showed an increase in tapping with the finger from the first to the last parts of the experiment, and four showed corresponding increases in rapidity with arm movements (12). The results would not lead one to believe that "fatigue with backward children, as would be expected from their low vitality, is very rapid and considerable"(Kelly, 12), but rather that "the lowering of interest and attention does not permit deduction regarding fatigue (Kuhlmann, 13).

3. *Attention.*—Most authorities agree that the lack of attention is the most common defect in the feeble-minded and the greatest hindrance to their education. If the attention can be sufficiently aroused and trained it is probable that other deficiencies will give place to a more normal condition. Since this matter is considered of such importance we should expect much time given it in the experimental determination of the condition in imbeciles and idiots, but unfortunately few of the experimental studies consider the subject.

The results of the experiments upon motor ability and fatigue reported above give some indication of the extent of the attention. Kuhlmann (13) compared the maximal and the normal rate of tapping, and found an average increase of only 1½ taps per second when the attention was directed to make movements as rapidly as possible. (One subject showed a decrease in rate and another gave practically the same results in both sets of experiments.) The maximum rate is much slower than in normal children. When the subjects were told to tap in time with the beat of a metronome the accuracy was much greater during the first half minute than at any later time. It seems evident, therefore, that the attention was kept up for about 30 seconds. The esthesiometric tests of Consoni (10) show, in a uniformity of the double-point threshold, a considerable degree of attention to stimuli of one kind but when distracting influences were brought in—lights, counting blows on the other hand, counting the beats of a metronome, odors, tasting solutions, etc.—the threshold was much greater and much more varied than in normal children. The alterations in attention were found more prominent in the phrenasthenics of the most marked type. Consoni appears to agree with Sollier in his conclusion: the degree of general capacity of attention is in direct relation to the power of inhibition, and the examination of the attention furnishes a precise means for the estimation of the degree of mental weakness.

4. *Reaction Times.*—Twenty-two children gave an average of .388 sec. (M. V., .08) for touch reaction, 21 experiments each; and 16 children, for sound, averaged .293 sec. (M. V., .085), 24 experiments each. Eight Mongolian type averaged .396 sec. for touch (M. V., .095), and .360 sec. for sound (M. V., .113) (5). The individual averages and variations are not recorded, and it is impossible to tell how much variation there is in the group and how large the individual variation is. Wylie concludes, however, from the experiments that "long reaction times and high mean variations seem to be characteristic" of the feeble-minded.

In his experiments on association Wehrlin noted the time for giving the associations in one high-grade idiot and four imbeciles. One subject was found to give reactions as rapidly as normal people, but the other four were very slow. The average time in seconds for the associations to concrete words was found to be 3.4 sec., normal subjects 1.8 sec.; to abstract words, 3.7 and 1.9 sec., respectively; to adjectives, 3.5 sec. and 1.9 sec.; and to verbs, 3.3 sec. and 2.2 sec. (14 and 15). Wreschner has in one subject the times of about 1,000 association reactions, but these have not been calculated in a manner that makes them available (4). The average time in his experiments is about 3 seconds. The naming of ten object pictures, the distributing cards of different kinds, etc., were used to determine the time for discrimination, association and movement in the subjects examined by Kuhlmann (13). For naming a picture and distributing a picture card Kuhlmann found an average time of 1.48 and 1.46 sec., respectively. For distributing colored cards, 1.67 sec., and for form cards, 1.93 sec. The general average for the discrimination, association and movement for one card is 1.64 sec. In addition, the author made separate tests of discrimination time with dominoes, in which experiments the time was very long. No direct comparison is given for normal children.

5. *Association and Memory.*—As was to be expected, the associations of idiots and imbeciles are simple and not very varied. Wreschner (4) used as stimulus words, (*a*) adjectives descriptive of light and color, form and direction, movement, touch, temperature, hearing, smell, taste, pain and general sensations and esthetic feelings; (*b*) nouns—parts of the body, objects in a room, in a house, in a city, in the earth, botanical words, names of animals, members of a family, and occupations; (*c*) abstract words—with cheerful and sorrowful idea content, descriptions of feelings, will, understanding and consciousness, legal conditions and interjections. These words were used as stimuli ten times each. The associated words

which were given are noted in detail and the time in seconds for each association. These are grouped, classified and analyzed in detail. One is struck with the persistence of certain associations throughout the series of ten, and with the fact that there are so many purely sound associations. He finds that the relative number of sound associations for adjectives is 1:3.8; for concrete words, 1:0.7, and for abstract words, 1:0.9. The content associations take a longer time than the sound association, and this is particularly noticeable if the sound and content associations for the same stimulus words are considered. Only one case was tested by Wreschner, viz., an idiot. Wehrlin experimented on 13 idiots and imbeciles—average age, 40—with 58 to 290 experiments each. The simple character of the "associations" is evidenced by the following list of kinds of associations which were given (14 and 15):

1. Tendency to definition: *e. g.*, "year"—"12 months."
2. Tautology: *e. g.*, "run"—"a man runs"; "hair"—"beautiful hair."
3. Generalization: *e. g.*, "bread"—"eatable."
4. Time, origin, use, etc., characterization: *e. g.*, "book"— "for reading."
5. General functions: *e. g.*, "wood"—"it burns"; "bird"—"it flies."
6. Examples and reminiscences: *e. g.*, "sick"—"I was sick"; "father"—"he threw me down stairs once."

Probably in no other single aspect of mental activity of the feeble-minded are there so varied differences as in memory. Many are unable to remember the simplest words, while others have remarkable memories for special things, *e. g.*, calculation, playing musical instruments, etc. Jonckheere (11) reports two cases of remarkable memory. An imbecile boy examined by him could recognize and name in French or German the disks for a music box with which he played, although he could not read. In this case there was a memory of the arrangement of holes in the disk, or probably of the design of the inscription. Another feeble-minded boy, who entered the school at the age of 9½ with only a German vocabulary learned in 3½ years French and the Flemish patois, and can recite in Dutch. Many of the children of the Vaucluse School have been found to compare favorably with normal children in their memory for numbers and words (copying 50 figures and two sentences); but idiots and imbeciles do poorly in all three tests (2).

Four numerals can be immediately repeated by many feeble-minded, and some can give five or six (12). Wylie tested the visual memory by having children pick out 5 cards (containing colors, letters or forms) previously shown to them, from a number, with the following average results: Form, 2.4 cards recognized; color, 2.4; letters, 2.6 (7). Similar results were obtained by Kuhlmann (13). The auditory memory was tested by repetition of six associated words, repetition of groups of sentences, and selection of five nonsense syllables, with the following results: Average number of words given correctly, 3.8; words in sentences, 11; nonsense syllables, 2.1.

6. *Miscellaneous Observations.*—All authors agree that the notions of time and space are very difficult to teach the feeble-minded (Sollier, Demoor and Daniel, and Jonckheere). Time is much more difficult than space, and past time much harder than future (11).

Like other mentally underdeveloped people, bright colors are most often preferred. Music with its rhythm has a wonderfully dynamogenic effect, and in some schools it is being used with excellent results in classes for gymnastics and motor training. JELLIFFE.

THE NEURITIC FORM OF ALBUMINURIC RETINITIS. A. J. Ballantyne (The Ophthalmoscope, April, 1905).

The author draws the following conclusions:

First, the neuritic form of albuminuric retinitis is of rare occurrence.

Second, it is found usually in cases presenting severe cerebral symptoms, and may thus lead to suspicion of cerebral tumor. Renal disease must, therefore, be excluded before resorting to a diagnosis of cerebral tumor in such cases.

Third, it is probable that in most cases other slight retinal changes are to be found at some time or other, which would point to the renal origin of the condition.

Fourth, it occurs mainly in cases of advanced chronic interstitial nephritis, but may also accompany other apparently less advanced forms of renal disease.

Fifth, the condition of the nerve is probably of the same nature as the choked disc of intracranial disease, and like it, is to be attributed to increase of intracranial pressure.

Sixth, its occurrence suggests a grave prognosis, and is usually soon followed by a fatal result. J. E. CLARK (New York).

SYPHILIS AND GENERAL PARALYSIS. Professor Fournier, at the Académie de Médicine de Paris.

Professor Fournier gives the following conclusions based on twelve cases in which the dates of the chancre were known. General paralysis does not occur in the first two years and rarely before the sixth, being most common in the period between the sixth and twelfth years. Cerebral syphilis in 223 cases observed occurred from the first year, and two-thirds of the cases within the first five years. He believes that insufficiency of treatment is chiefly responsible for the occurrence of general paralysis. Among 79 cases 5 per cent. occurred when the treatment was prolonged for three or four years, 15 per cent. with treatment from one and a half to two years, and 80 per cent. in cases treated for less than a year. He advocates prophylaxis by prolonged mercurial treatment, iodides having little effect. He proposes intense tretament for two years, with periods of rest, cessation of treatment for two years, and in the fifth year a second course of a year's duration, followed by a third course in the seventh or eighth year. He regards mercury as analogous to vaccine, and believes that the patient must be remercuralized to protect him from subsequent signs of syphilis. JELLIFFE.

SYPHILIS AND GENERAL PARALYSIS. Stonziale (Gazette des Hopitaux, No. 8, 1905.

In 70 out of 100 cases of progressive paralysis, statistics of which were collected by the author, signs of syphilis were plain, and in 17 cases there were doubtful signs. In 32 cases syphilis was the sole etiological factor; in 38 it was associated with other causes, especially a neuropathic heredity and alcoholism. Histological examination in nine fatal cases of the cerebral arterial system revealed periarteritis and endarteritis due to syphilis. Intense mercurial treatment failed to modify the course of the disease even where the syphilis was evident and the paralysis not far advanced. JELLIFFE.

KERNIG'S SIGN IN GENERAL PARALYSIS. Barcanne and Moreaux (Gazetta degli Ospedali, April 27, 1905).

Kernig's symptom is rather frequent in general paralysis, even in the early stages. The authors report 26 cases of general paralysis. This is important as excluding Kernig's sign from its pathognomic relations to meningitis. Irritation of the motor tracts near the base of the brain seems to cause this symptom in several conditions. NOYES (New York).

PARALYSIS OF BOTH THIRD CRANIAL NERVES WITH DOUBLE OPTIC NEURITIS. A. N. Walker (Liverpool Medico-Chirurgical Journal, No. 46).

The author reports the case of a widow, 49 years old, who presented the characteristic appearance, both eyes being closed, the eyebrows upraised and the forehead wrinkled from contraction of the occipito-frontal muscle. Upon raising the lids the eyes were seen to turn outward, the pupils being fixed and dilated. Examination with the ophthalmoscope showed that both optic discs were pale and the vessels contracted. The personal history noted an attack two years before the "inflammation of the bowels" with severe headache and vomiting, during which the right eye turned outward and closed. Six months after, the left eye did the same. She had had eleven miscarriages, and two children born alive. The author notes that double optic atrophy, without signs of disease in retinæ and choroid, points to atrophy consecutive to disease of nerve trunks. But complete paralysis of the muscles supplied by both third nerves points to interference with the latter rather than to a nuclear lesion. Probably the correct diagnosis was that of a syphilitic gumma at the base of the brain involving the optic nerves and the third nerves on each side.

JELLIFFE..

CHANGES IN THE NERVOUS SYSTEM INDUCED BY THE INJECTION OF THE GONOCOCCUS. Dr Osokin (Die Medicinische Woche., Nov. 12, 1904).

Dr. Osokin, after commenting on the mistaken idea which obtained for so long that gonorrhea was a strictly local malady and one free from complications affecting the organism, whereas it has been proved that it leads to the occurrence of endocarditis, peritonitis, pruritus, stomatitis and to several maladies affecting the nervous system, reports the results of his experiments on guinea pigs, ten of which had been injected with cultures of the gonococcus, and ten others poisoned by gonococcus toxins. Of the first ten, three died, one following the eighth and the others following the seventeenth injection. Of the second ten, six died, one after the third, another after the fifth and four after the eighth injection. The remaining four were killed after the eighth injection. The injections were given each day. Microscopic examination yielded no uniform result. In many cases the changes in the spinal cord were marked, in others but slight. This variation is not easily accounted for, but it may be due to individual idiosyncrasy or to varying degrees of toxicity employed. In one case the chromatophores were greatly reduced. The author concludes that the entrance of the gonococcus into the animal economy may seriously affect the integrity of the spinal cord. At present, however, the evidence in hand will not permit an exact account of the action of the gonococcus on the nervous system.

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